

REMARKS

Claims 1, 3-12, 14-19, and 21-24 were pending in the application. Claims 1, 12, and 19 have been amended. Claims 10, 11, 18 and 24 have been cancelled. Claims 1, 3-9, 12, 14-17, 19, and 21-23 remain pending in the application.

35 U.S.C. § 102 Rejection:

Claims 1, 4-8, 10-12, 15-16, 18-19 and 21-24 were rejected under 35 U.S.C. § 102(e) as being anticipated by Rhee, U.S. Patent 6,804,790. Applicant respectfully traverses this rejection.

The cited reference fails to teach or suggest all of the elements of the independent claims. The teachings of Rhee were discussed in the previous office action response.

Independent claim 1 recites:

“A method for operating a computer system comprising a first and a second computing unit, the method comprising selecting a first clock frequency for operation of said first computing unit, wherein said first frequency is a function of a first predetermined number allocated to said first computing unit, and selecting a second clock frequency for operation of said second computing unit, wherein said second clock frequency is different from said first clock frequency, wherein said second frequency is a function of a second predetermined number allocated to said second computing unit, wherein said first and said second clock frequency are each dynamically allocated to a respective computing unit on start-up or resetting of the system, and wherein said first and said second frequencies differ one from the other by at least a predetermined bandwidth”
(Emphasis added)

Independent claims 12 and 19 recite similar combinations of features.

In the present office action, the Examiner contends that Rhee discloses that said first and second clock frequencies are dynamically allocated to respective computing units on start-up or resetting of the system. The Examiner also contends that this limitation is inherent in Rhee's teachings. Applicant respectfully disagrees for at least the following reasons.

In support of his contention, the Examiner cites Fig. 1, col. 2 lines 17-21 and 48-49, col. 3, lines 28-31 and 51-62, col. 4 lines 30-32 and col. 6 lines 3-7. Fig. 1 and each of the portions of Rhee's specification teach that a plurality of processing units may operate at different frequencies. However, Rhee is silent in these citations and elsewhere concerning how these frequencies are determined on system startup or resetting of the system. Rhee provides no express or implied teaching regarding the allocation of clock frequencies to processing units upon system start-up or resetting of the system.

Furthermore, Applicant disagrees that it is inherent that Rhee teaches "wherein said first and said second clock frequency [which are different from each other] are each dynamically allocated to a respective computing unit on start-up or resetting of the system." In col. 3, lines 56-60, Rhee states:

"Each processing unit operates at a given clock frequency, f.sub.1, f.sub.2, f.sub.3, f.sub.4, . . . f.sub.N, respectively. The clock frequencies may all be the same, one or more of the clock frequencies may be the same, or all of the clock frequencies may be different." (Emphasis added).

Similarly, in col. 6, lines 5-8, Rhee states:

"In a preferred embodiment, the clock frequencies of each of the plurality of processing units is different, although this is not a necessary limitation." (Emphasis added).

Thus, Rhee teaches that the clock frequencies may be the same, or conversely, that the clock frequencies are not always different from each other. Rhee also teaches that an object of his disclosure is minimization of power usage:

“It is therefore an object of this invention to provide a networked processing system in which power usage is minimized.” (Rhee, col. 1, lines 58-60; emphasis added).

Thus, since it is an object of Rhee to minimize power usage and in light of Rhee’s teachings that one or more of the clock frequencies may be the same, it is thus not inherent that each processing unit is allocated to a different clock frequency upon system start-up or system reset, particularly if allocating different clock frequencies to each processing unit at start-up does not minimize power usage.

Applicant further notes Rhee’s statement in col. 2, lines 5-10:

“The invention results from the realization that, in a multi-tasking, multi-processor environment, the power efficiency of the system can be optimized by coordinating the usage of processing units such that tasks are run on the appropriate speed processing unit and unused processing units are placed in sleep mode.” (Emphasis added).

Applicant submits that, in the above citation, Rhee suggests that clock frequencies for each processing unit may be changed subsequent to system start-up or system reset in accordance with the processing tasks that arise. Furthermore, since unused processing units are placed in sleep mode, Rhee suggests that when two or more processing units are unused, they may (subsequent to system start-up or reset) be allocated to operate at clock frequencies (e.g., 0 Hz or other power-minimizing clock frequency) as each other.

For at least these reasons, Applicant submits that **Rhee fails to teach all of the limitations of the independent claims, including the limitation of “wherein said first”**

and said second clock frequency are each dynamically allocated to a respective computing unit on start-up or resetting of the system” wherein “said second clock frequency is different from said first clock frequency.” Applicant further submits that, for at least these reasons, the recited limitations are not inherent in Rhee. Accordingly, removal of the 35 U.S.C. § 102(e) rejection is respectfully requested.

35 U.S.C. § 103 Rejection:

Claims 3, 9, 14, 17, and 23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Rhee. Applicant respectfully traverses this rejection.

Applicant notes that each of the claims subject to the § 103 rejection depend from one of the independent claims discussed above, and thus incorporate their respective limitations. Thus, for at least the reasons stated above, Applicant submits that **the prior art teachings, taken singly or in combination, fail to teach or suggest all of the elements of the claims.** Applicant also submits that the claims subject to the § 103 rejection are allowable for at least the following additional reasons.

Claims 3 and 14:

Claim 3 recites:

“A method according to claim 1 wherein said first predetermined number and said second predetermined number are each generated by a random number generator” (Emphasis added).

Applicant notes that the recited first and second clock frequencies recited in claim 1 are a function of the first and second predetermined numbers, respectively. Claim 14 recites a similar combination of features.

The Examiner contends that since a random number generator is well known in the art, it would have been obvious to utilize a random number generator to use in the

function to calculate different frequencies. Applicant respectfully disagrees, and submits that it would not be obvious, particularly in light of Rhee's teachings regarding the minimizing of power usage.

As noted above, an object of Rhee's disclosure is the minimization of power usage:

"It is therefore an object of this invention to provide a networked processing system in which power usage is minimized." (Rhee, col. 1, lines 58-60; emphasis added).

In accordance with this object, Rhee teaches a protocol for coordinating usage of the processing units such that power consumption of the system is minimized:

"The invention results from the realization that, in a multi-tasking, multi-processor environment, the power efficiency of the system can be optimized by coordinating the usage of processing units such that tasks are run on the appropriate speed processing unit and unused processing units are placed in sleep mode.

This invention features a networked computing system with improved power consumption comprising a plurality of processing units including at least first and second processing units. A coordinating protocol is operative on the first and second processing units and controls the operation of the system such that the power consumption of the system is minimized." (Rhee, col. 2, lines 5-16; emphasis added).

Accordingly, it is clear that Rhee does not assign clock frequencies to processing units as a function of randomly generated numbers, but rather based on tasks to be performed by the processing units, where tasks are to be run on an appropriate speed processing unit.

In fact, in the ‘Response to Arguments’ section of the present office action, the Examiner states that “Rhee can [just] not assign any frequency to any processor randomly as Rhee provides a coordinating protocol for a multi-processing system in a manner such that the power efficiency is optimized.” Thus, in addition to Rhee’s teachings above, the Examiner admits that assigning frequencies to processing units is not a random process.

Thus, since assigning clock frequencies to processing units of Rhee is not a random process, Applicant submits that **the proposed modification of Rhee would change its principle of operation.**

In addition, given the potential inefficient use of power resulting from generating the predetermined numbers (and thus assigning the clock frequencies randomly), Applicant submits that **the modification proposed by the Examiner would render Rhee unsatisfactory for its intended purpose.**

Thus, in light of both Rhee’s teachings and the Examiner’s admission, Applicant respectfully submits that it would not be obvious to modify Rhee to assign clock frequencies based on first and second predetermined numbers “wherein said first predetermined number and said second predetermined number are each generated by a random number generator.”

Claims 9, 17 and 23:

Claim 9 recites:

“A method according to claim 1 wherein said first predetermined number is determined as a function of a digit of the address of the respective computing unit” (Emphasis added).

Claims 17 and 23 recite similar combinations of features.

In the office action, the Examiner contends it would be obvious to modify Rhee to utilize a function of a digit of the processing unit to determine the [predetermined] number. However, as previously noted, and as acknowledged by the Examiner, Rhee provides a coordinating protocol for a multi-processing system in a manner such that the power efficiency is optimized wherein tasks are assigned to the appropriate speed processing unit. Thus, the modification proposed by the Examiner would change Rhee's principle of operation from one of assigning clock frequencies to processor such that the appropriate tasks are run on the appropriate speed processing unit to one where clock frequencies are assigned to a processing unit as a function of a number that is "determined as a function of a digit of the address of the respective computing unit." Furthermore, assigning clock frequencies to processing units in this manner cannot guarantee that power usage is optimized, and thus would render Rhee unsatisfactory for its intended purpose.

Since the proposed modification both changes the principle of operation of Rhee and renders it unsatisfactory for its intended purpose, Applicant submits that it would not be obvious to modify Rhee as proposed by the Examiner.

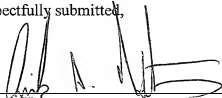
For at least these reasons, Applicant submits that a case of obviousness has not been established with regard to claims 3, 9, 14, 17, and 23. Accordingly, removal of the 35 U.S.C. § 103 rejections thereto is respectfully requested.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert, & Goetzel, P.C. Deposit Account No. 501505/5681-92600/EAH.

Respectfully submitted,



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